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General Notes.

GEOGRAPHY AND TRAVEL.

Africa.—Lake Tanganyika.—According to Mr. E. C. Hore, Lake Tanganyika, although there is one African lake the water of which stands at a higher level, has the highest watershed in the continent, and the depression which is enclosed by this watershed, including the hilly table-land of Unyamwezi, may be regarded as the central basin of Africa. The crest of this steep watershed hugs the lake on its western side, but on the eastern is at a considerable distance from it, surrounding the hilly plateau inhabited by the Wanyanwezi. Until recently there was no natural outlet to this lake, but of recent years the waters seem to have risen higher than ever before, until they at length burst open an outlet at a low point upon the eastern shore, where the strata were soft. This gap is the Lukuga River, about which so much has been written, and through it the surplus waters of the lake flow to add their volume to that of the Congo. The barrier once burst, the lake waters have continued their work of cutting down the soft clay, and evidently will continue to do so until the hard rock is reached. At the time of the visit of Commander Cameron, the lake seems to have been higher than it had ever been before, for its recession reveals the stumps of trees that once flourished around the margin. The water level is now eighteen feet lower than it was in 1878; and while of the lower ten feet of this space five is occupied by the stumps of dead trees, the lower five feet is without trees, showing that the present level is lower than any previous one. The Lukuga is now flowing more slowly than it has been. Much of the scenery around the lake is of the grandest description, as might be expected from its position at the bottom of a long north and south chasm. Severe storms sometimes arise, which the natives ride out by jumping overboard and holding on by the boat.

Around this lake, besides the apparently more ancient inhabitants, the Wanyamwezi, who have a horror of water, are grouped representatives of all the African families, the Bantu or Kaffir, the negro, the Semitico-Africano, the dwarfs, and that unclassified group to which the Masai belong. Most of these tribes are expert in the management of their canoes, and thus contrast strongly with the original inhabitants.

The Bissougas.—E. Stallibras (Proc. Roy. Geog. Soc.) gives an account of the Islands of Bijouja, or Bissouga, situate upon the West African coast, in the deltas of the Jeba, Bolola, and Cassini rivers. The largest of these, Orango, is twenty miles long by ten in width, and others are Kanabek, Formosa, Corbelha, and Karashe. All these consist of decomposed volcanic soil, and are thickly covered with wood. Other islands near the Jeba mouth are Bissao, Bassis, and Jatt, while near that of the Bololo are Bissagua, Biafares, Bulama, &c., many of them at present unexplored.

The Portuguese established a fort on Bissao about 1703, but it was afterwards abandoned. In 1792 the English established a colony at Point Beaver, but it proved a complete failure. After this they started a colony upon Bulama, but the islands were by the arbitration of the United States adjudged to Portugal, and the English left in 1868. The present condition of the islands, according to our author, is not flourishing, yet they have a submarine cable.

Stanley's Discoveries.—The letters of Mr. Stanley, published in all the papers, have made the principal points of his discoveries during his last expedition so familiar to every one that it seems superfluous to go over the same ground. Yet there is something strangely fascinating in the encounter, at the head of the Albert Nyanza, and on the eastern flank of the Semliki, which connects that lake with the smaller and more southerly one which Stanley would have us call the Albert Edward, of a snow-capped mountain, believed by its discoverer to be the same as the almost fabulous Mountains of the Moon. Whether subsequent researches will confirm or invalidate Stanley's conclusions in this matter remains to be proved, but in the meantime we can be certain that another peak of 15,000 feet in height is added to those which recent years have revealed in the heart of Africa, and also that another affluent of the great river has been discovered.

The Congo Railway.—Captain Thys has, in a recent issue of the Proceedings of the Royal Geographical Society, given some interesting particulars regarding the Congo Railway, which is to commence at Matadi, a point that can be reached by steamers, and will finish at Ndolo, above the uppermost rapid. The cost of this railroad is said to have been most liberally estimated, yet will not exceed £1,000,000. The most formidable difficulties are encountered in the first twenty-six kilometres of the road, the total length of which will be 435 kilometres.

The Italian Protectorate.—In the partition of the coasts of Africa among the European powers, with undefined claims ex-

tending into the interior, Italy has not been forgotten. Her territory around Massowah has been extended to 18.2 N. Lat., while it stretches southward to the southern boundary of Baliata, and thus contains 200,000 inhabitants. The Habab, Beni Amer, and other tribes are also said to have recently recognized the Italian protectorate.

On the Somali coast her protectorate extends from the Zanzibar district of Warshekh in 2.30 N. Lat., to Wadi Nogal in 8.3 N. Lat. It is also said that the Sultan of the Midjertin-Somal, whose territory reaches from Ras Hafim, has placed the northern part of his dominions under the protection of Italy.

Lake Rudolph.—Von Hohnel, arguing from the accounts given by Sr. Borelli and Count Teleki, considers it provable that the River Omo of the former falls into Lake Rudolph, discovered by the latter. Lake Rudolph extends from 2.16 to 4.47 N. Lat., and has an area of about 3050 square miles. It is surrounded by a flat desert country, but towards the north the level varies, and at this end enter two perennial streams, the Bass and the Niam-niam. The Niam-niam is about 100 yards wide in its lower course, and has a slight current, while the Bass, the lower course of which is parallel to the former river, has a width of about a mile and a quarter, but is shallow, and has no perceptible current. At the southern end of the lake two streams also enter, but these are dry save in the wet season. Their names are the Irrquell and Kecio. The lake has no outlet, and it is the Niam-niam which is believed to be Borelli's Omo. The description given by Borelli of Lake Shambara, into which he traced the Omo, does not accord with Lake Rudolph, but Lake Shambara is said to have an outlet, and Von Hohnel believes that the Omo flows through it into Lake Rudolph or Basso Narok. A few miles north-east of Lake Rudolph is a smaller lake, one-eighth the size of the former, and known as Basso Ebor or Lake Stephanie. This also has no outlet, and is rapidly drying up.

In the *Zeitschrift der Gesellschaft für Erdkunde* (Berlin), Paul Reichard gives a long account of the Wanyamwezi of the plateau east of Tanganyika, their physical characters, customs, and modes of life.

The French geographers are greatly elated that at last, after most of the difficulties of the way have been surmounted by others, a French traveler, M. Trivier, has crossed the African continent, passing up the Congo by Stanley Pool and Tippoo-Tib's quarters, and debouching at Mozambique. The editor of the *Revue Géographique*, in recounting the details of the trip, has some remarks to make respecting

the probable ulterior objects of Stanley's expedition—remarks that seem not unlikely to be founded on fact.

Captain V. Nicolasis is contributing to the *Revue Géographique* a series of articles upon West and South Madagascar.

Asia.—The Bahrein Islands.—M. J. Theodore Bent (Proc. Roy. Geog. Soc.) gives a description of the Bahrein Islands in the Persian Gulf, upon the Arabian coast. The pearl fisheries of these islands have been famous from the days of Nearchus until now, and who has not heard of the subaqueous springs of fresh water upon their coast?

Mr. Bent was, however, impelled to investigate the group from archeological reasons, his object being to search some of the numerous mounds which are to be found in them, notably in Bahrein itself. This island is twenty-seven miles long and ten wide, Moharek is five miles in length, and has a width of half a mile, while the rest are mere rocks. Among these are Sayeh, Khasafeh, Manaweh and Arad, the latter a Phœnician name. Bahrein has a population of about 8,000, and the group is governed by an hereditary Sheikh, who is now under the protection of Britain. Bahrein has many subterranean springs, related in their nature to those which in some places rise under the surface of the gulf. The first European nation to put in an appearance at this group was the Portuguese, who came under Albuquerque in 1506, and whose power lasted until 1622, when Shah Abbas, assisted by an English fleet, took Hormuz and Bahrein. The islands fell into the power of the Arabs in 1711.

The extensive group of mounds, some of which were explored by Mr. Bent, is situated near the village of Ali, and examples reach a height of forty feet. After digging through hard earth for fifteen feet, a layer of loose stones two feet thick was met with, then one of decayed palm branches. Under these a two-story tomb, the lower chamber higher than the upper, was discovered, and its structure was so similar to that of Phœnician tombs in general as to lend support to the idea that these islands were either the original home of that people, or at least one of their earliest settlements. The upper chamber contained fragments of ivory, bits of a statue of a bull, circular boxes, etc., in a word the treasures of the deceased, whose body was buried in the lower chamber where traces of bones were found, together with the decayed remnants of drapery and remains of the wooden pins used to fasten it to the walls.

The Prejevalsky Expedition.—The Russian exploring expedition, formerly conducted by the lamented Prejevalsky, is now under the command of Col. Pievsoff, who is continuing the work energetically. Letters have been forwarded to the Royal Geographical Society by Lieut. Roborovsky. The expedition left Prjevalsk May 13th, and after passing Silvkina ascended the Barskounski Pass, traveled for a week over an elevated sirt 10,000 to 11,000 feet above the sea, crossed the Tauskan Daria, and then proceeded towards Yarkand. The Kashgar Daria no longer reaches the Yarkand, but is lost in irrigation canals at Marat-bash. The flat banks of the Yarkand are bordered with a belt of vegetation fifteen to twenty miles in width on each side, including two species of poplar and *Holostachus*. Many ruins of old and unknown cities are to be found in these deserts, the thickets abound in tigers and boars, and wild camels graze on the barchans around.

The town of Yarkand consists of an old Mahometan city with thirty to forty thousand inhabitants, and a new Chinese city. The water is very bad and there is much goitre. Passing Khoten Col. Pievtsoff has reached Nia, where he will winter, and then search for a route into Tibet over the Taguz-Daban range, some of the peaks of which were estimated by Prejevalsky at 22,000 to 23,000 feet.

A large portion of the November number of the Proceedings of the Royal Geographical Society is occupied by the diary of the journeyings of David Lindsay in the interior of Australia, which he crossed from north to south, keeping within the boundaries of the colony of South Australia somewhat to the west of Queensland. The account is accompanied by a map of the route with the survey lines given. There is also a glossary of native words.

Dr. Hagen traces the Malays to West Sumatra, and believes that the present natives of the interior of the large islands (the Dyaks of Borneo, etc.) were the first emigrants from the original site, and crushed out the negritos in the countries occupied by them. This migration was followed by others, the last emigration of the Malays taking place about the twelfth to the fifteenth century. The purest Malay type is to be seen in the Battas and Allas of Sumatra.

A series of articles by A. de Leanarde upon the country of the Amur and the Ossory is completed in the *Revue Geographique*, of January, 1890.

A recent issue of the Proceedings of the Royal Geographical Society, gives the heights of some of the principal summits of New Guinea. Mount Victoria, ascended by Sir W. Macgregor on the 11th of June, 1889, is 13,121 feet high; Mt. Albert Edward, 12,500; Mt. Scratchley, 12,000; Mt. Knutsford, 11,157; Mt. Douglas, 11,796; Mt. Griffiths, 11,000; and Mts. McIlwraith and Morehead, ten to eleven thousand feet.

Europe.—Cyprus.—The British governor of Cyprus, Sir R. Bidulph, gives in the Proceedings of the Royal Geographical Society an interesting account of that recent acquisition of the British Empire.

The peculiar form of the island is due to the existence of two ranges of mountains; the one long and narrow, hugging the northern shore at a distance of only about two miles, and the other broader and shorter, placed somewhat to the westward of the former, and considerably to the south. The space between these two ranges is occupied by a broad fertile plain known as the Mesaorea. The northern range terminates westward at Cape Kormakiti, and eastward at Cape San Andrea. One of its highest peaks, Kornos, is 3105 feet. An abundant stream, issuing at a height of 870 feet on the southern side, waters the thriving village of Kythrea, and another, issuing on the northern slope, waters the two flourishing villages of Lapithos and Caravas. The southern range is not only more extensive than the northern, but its summits are loftier. The eastern point of this range is the Mountain of the Holy Cross, crowned by the monastery of Santa Croce, and conspicuous from the harbor of Famagusta. This peak is less than three thousand feet, but Mt. Machera to the westward is 4674; while Mt. Adelphe, still further to the west, is 5305 feet, and the culminating point, Mt. Troonos, still more to the west, is 6406 feet. This extensive mountain area, which in some places is more than twenty miles wide, was once covered with forest, but the greater part of this has been cut down, to the great detriment of the fertility of the island, so that most of the woods now remaining are west of the summit of Mt. Troodos, in the western and widest portion of the range. A few moufflon still exist in the wildest parts of these mountains. Most of the rivers flow only after the rains. The largest are the Pedieus, which rises on the northern slope of Mt. Machera, and passes by the capital, Nicosia, and the Idalia, which has its sources on the eastern slopes of the same mountain. Both of these fall into the sea near the ruins of the ancient town of Salamis, and not far from Famagusta. Another stream, rising on the slopes of Mt. Adelphe, enters the sea on the western shore, near the populous village of Morrphou.

The chief causes of the disappearance of the forests are recent, and are indiscriminate wood-cutting, and goats. The island has more goats in proportion to population than any other part of Europe. It is also cursed with a peculiar small species of locust, which a few years since devastated the crops most fearfully, but has, during the last three or four years, been very successfully and energetically fought. The population of Cyprus under Venetian rule is said to have been two millions, though one seems more probable. At the present time, though numbers have increased under British rule, there are not more than 186,000, one-fourth of whom are Mahometans. This island has always been famous for its wines, for the sake of which Sultan Selim sent an army against it, and after an heroic resistance, ceasing only when the city of Famagusta had been sacked, and its brave defender Bragadino flayed alive, succeeded in reducing it under Moslem sway. One million six hundred thousand gallons of this wine are still made annually, but in a most primitive fashion, and four-fifths of this is exported. The whole of the land is divided into small holdings, of which there are 600,000 in all, so that there are more than three to each individual. The houses are, as a rule, built of sun-dried bricks. The capital, Nicosia, has 12,000 inhabitants; Larnaca, on the eastern coast, has 7,000; and Limassol, the southern port, has 6,000. The most interesting ruins are those of three castles of the times of the crusaders, and the oldest complete existing monastery is that of Santa Croce.

The Caucasus.—The Caucasus, with its peaks higher than the Alps, and a glacier system to which that of the better known mountains offers no comparison, is now the favored climbing-ground of Alpinists. During 1889, five elevated passes were crossed by Messrs. David Freshfield and Captain Powell. Among these, that of Saluinan-Chiran is at an elevation of 13,622 feet; while two others attain heights of 14,300 and 13,000 feet respectively. Mr. Herman Woolley ascended Dych-tau (14,923), and the eastern peak of Misahirgi-tau (16,100); while Vittorio and Erminio Sella climbed Elbruz and Mala-tau (15,351; this was the first ascension); also, together with Messrs. D. Freshfield and Powell, the peak of Leila (13,300).

Arctic Regions.—According to Dr. W. Kukenthal and A. Watter, the existing maps are in error regarding the two or three islands which form King Charles' Land. The latitude of these islands is 78.30 to 78.57 N., and the longitude 26.20 to 26.30 E. The east coast should thus be set back about 11 minutes.

The geology of King Charles' Land is allied to that of Spitzbergen. In the land lakes there are many insects and crustacea, but the mammals are only the usual ones of the arctic regions; bear, walrus, and seal are plentiful. There are a few mosses, which form the only vegetation.

The *Zoölogist* (Jan.) gives an account of the birds of Jan Mayen, translated from a paper by Dr. Fischer, of Vienna. This island is located in latitude 70.49 to 71.8 N., and longitude 7.26 to 8.44 west, and is 600 miles due north of the Faroe Isles. In color and character it much resembles Spitzbergen. At one part there are two volcanoes in close proximity, and at the northern end rises the mountain of Beerenberg, 6870 feet in height. Plants are scarce, and though many migrants visit the island, only sea-birds breed there regularly. Among the birds are *Falco candicans* and *F. peregrinus*, *Nyctea nivea*, *Erithacus rubecula*, *Saxifraga cenanthe*, *Turdus pilaris*, and *T. musicus*, *Motacilla alba*, *Anthus aquaticus*, and *Linota hornemanni*,—the latter a true Arctic species. Many waders occur, and here is the most northern recorded habitat of *Rallus aquaticus*. Many swimmers breed here, but only *Fulmarus glacialis* stays here all the year.

Mr. Thoruddsen, who is himself a native of Iceland, has recently devoted his time to the exploration of this still imperfectly known large island. In 1889 he explored the region of Fiskivotn, a waste between Hecla and Vatna Jokul, before for the most part unvisited. East and north of Hecla he found a new obsidian district. Crossing the Tunguaa, he visited the true crater lakes of Fiskivotn. In the district between these lakes and the Vatna Jokul there is no plant life; the entire area is covered with lava floods, with a large amount of volcanic sand. Lake Thorisvatn in this region is the second largest lake in the island. After a day's journey in an utterly desolate district, M. Thoroddsen discovered the sources of the Tunguaa, and south of this, between three ranges of before unknown hills, he found a long and narrow lake.

Miscellaneous.—No. 143 of the *Zeitschrift Gesell. f. Erdkunde* contains Dr. Polakowsky's account of the Central American State of Honduras, the first of a promised series upon these republics. This republic, which has a population of 331,917, is loaded by a large debt incurred on account of the inter-oceanic railway.

Mexico now has 4700 miles of railway, Brazil 6000, Peru 3000, Chili 1630, the Argentine Republic 4700, and the smaller republics

about 1500 miles, making a grand total of about 17,000 miles of railroads in operation in South America.

Sir F. de Winton also states that the railway mileage of Australia reaches 11,000.

GEOLOGY AND PALEONTOLOGY.

Seeley's Researches on the Organization, Structure, and Classification of the Fossil Reptilia.¹—The Royal Society of Great Britain granted Prof. H. G. Seeley a sum to be expended in prosecuting researches among the extinct Reptilia, and the results obtained up to the present time are embodied in the memoirs now before us.

The first is on that ancient form, both geologically and in the literature, the *Protorosaurus speneri*. From the upper Permian of Germany, no form is more worthy of investigation, but the character of the matrix is such as to render the elucidation of the characters of the skeleton difficult. Dr. Seeley concludes that the genus *Protorosaurus* has no affinity with any form of reptiles known to him. His figures and descriptions add much to our knowledge of its characters, and, as a result, its place appears to me to be nearer to other genera of Permian age of Europe and South Africa. Accordingly I have (NATURALIST, October, 1889) placed it with them in the Theromora, to which location its characters distinctly point.

The second paper describes that remarkable form *Pariasaurus bombidens* Owen, from the Karoo Series of South Africa, which is of Permian or Triassic age. The new investigation is based on a nearly perfect skeleton in the collection of the British Museum, and the information furnished elucidates the systematic position of the genus almost completely. Dr. Seeley concludes that it belongs to the Theromora "Anomodontia"), and to a subdivision of that order which he calls the Pareiasauria. The characters of this suborder are as follows (p. 292, Philos. Trans., 1889, p. 292): "Occipital" condyle "basioccipital; no temporal vacuities; no median bar to interclavicle."² He shows that the ribs are single-headed, and attached to the diapophyses

¹ I. On *Protorosaurus speneri* Von Meyer (1887). II. On *Pariasaurus bombidens* Owen (1888). III. On *Theriodon phylarchus* Seeley (1888). IV. On the Anomodont Reptiles and their allies (1889). All from the Philosophical Transactions of the Royal Society, 1887-9.

² For scapular arch of *Diadectes*, see Proc. Amer. Philos. Society, 1883, p. 635.